

U1500s

High Voltage Differential Probe

Instructions

Introduction

The Fluke U1500s High Voltage Differential Probe (the Probe or Product) is a portable voltage sensor with a 1500 V dc/1000 V ac range and 0.1 % accuracy.

How to Contact Fluke

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-6714-3114
- Singapore: +65-6799-5566
- Anywhere in the world: +1-425-446-5500
- Customer Service Center (Fluke China): + 400-810-3435
- Maintenance Service Center (Fluke China): +400-921-0835

To view, print, or download the latest manual supplement, visit <http://us.fluke.com/usen/support/manuals>.

Go to www.fluke.com to register your product and find more information.

Safety

A **Warning** identifies conditions and procedures that are dangerous to the user.

⚠⚠ Warning

To prevent personal injury and for safe operation of the Product:

- **Read all safety information before you use the Product.**
- **Use the Product only as specified, or the protection supplied by the Product can be compromised.**
- **Comply with local and national safety codes. Use personal protective equipment (approved rubber gloves, face protection, and flame-resistant clothes) to prevent shock and arc blast injury where hazardous live conductors are exposed.**

- **Examine the case before you use the Product. Look for cracks or missing plastic. Carefully look at the insulation around the terminals.**
- **Do not use the Product around explosive gas, vapor, or in damp or wet environments.**
- **Use Product-approved measurement category (CAT), voltage, and amperage rated accessories (probes, test leads, and adapters) for all measurements.**
- **Do not use test leads if they are damaged. Examine the test leads for damaged insulation and measure a known voltage.**
- **Do not use the Product if it is damaged.**
- **Do not use the Product if it operates incorrectly.**
- **The battery door must be closed and locked before you operate the Product.**
- **Remove all probes, test leads, and accessories before the battery door is opened.**
- **Do not work alone.**
- **Do not exceed the Measurement Category (CAT) rating of the lowest rated individual component of a Product, probe, or accessory.**
- **Do not touch voltages >30 V ac rms, 42 V ac peak, or 60 V dc.**
- **Do not apply more than the rated voltage, between the terminals or between each terminal and earth ground.**
- **Measure a known voltage first to make sure that the Product operates correctly.**
- **Disable the Product if it is damaged.**
- **Use only specified replacement parts.**
- **Have an approved technician repair the Product.**

Table 1 shows the symbols that can be used on the Product or in this manual.

Table 1. Symbols

Symbol	Definition
	WARNING - RISK OF DANGER.
	WARNING. HAZARDOUS VOLTAGE. Risk of electric shock.
	Consult user documentation.
	Earth
	Double Insulated
 Alkaline	Battery
	Conforms to European Union directives.
	Certified by CSA Group to North American safety standards.

Table 1. Symbols (continued)

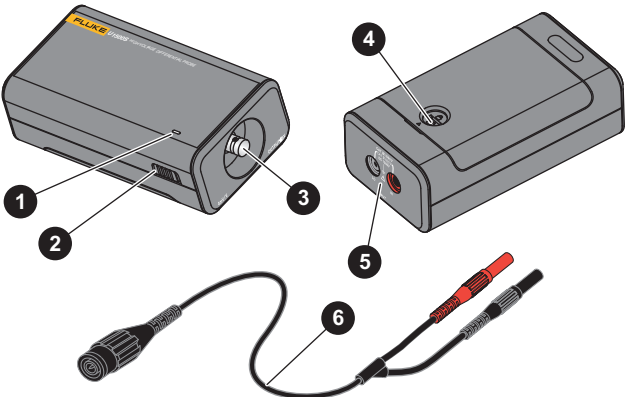
Symbol	Definition
	Conforms to relevant Australian Safety and EMC standards.
	Conforms to relevant South Korean EMC Standards.
CAT III	Measurement Category III is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage MAINS installation.
CAT IV	Measurement Category IV is applicable to test and measuring circuits connected at the source of the building's low-voltage MAINS installation.
	This product complies with the WEEE Directive marking requirements. The affixed label indicates that you must not discard this electrical/electronic product in domestic household waste. Product Category: With reference to the equipment types in the WEEE Directive Annex I, this product is classed as category 9 "Monitoring and Control Instrumentation" product. Do not dispose of this product as unsorted municipal waste.

Instructions

Table 2 shows the Product. To use the Product:

1. Connect the input and output test leads to the Product (see 5 and 3 in Table 2).
2. Connect the output test lead (BNC to Banana cable) to the power analyzer, oscilloscope, or other instruments.
3. Set proper scale for the power analyzer or other instruments, and adjust the sensitivity based on the tested voltage.
4. Turn on the Product 2.
The power indicator light (see 1 Table 2) flashes green. If the battery light flashes red, change the batteries.
5. Connect the input test lead to the DUT (Device Under Test) and start the test.
Keep the Product away from high-voltage pulse circuits to reduce interference to the Product while testing.
6. Disconnect the test leads from the DUT, and turn off the Product after test completion, then unplug the test leads.

Table 2. The Product



Item	Description
1	Battery indicator (red flash = low battery, green flash = battery ok)
2	Power switch
3	Output terminal
4	Battery door fastener
5	Input terminals
6	Output Test lead

Battery

⚠⚠ Warning

To prevent possible electrical shock, fire, or personal injury:

- **Disconnect the Product from any measurement device before you install or replace the batteries.**
- **Replace the batteries when the low battery indicator shows to prevent incorrect measurements.**

To install the batteries, see Figure 1:

1. Disconnect all Probe connections.
2. Make sure that the power switch is OFF.
3. Use a flat-blade screwdriver to rotate the battery door fastener to the unlocked position.
4. Remove the battery door.
5. Install the new batteries with the correct polarity.
6. Lock the battery door.

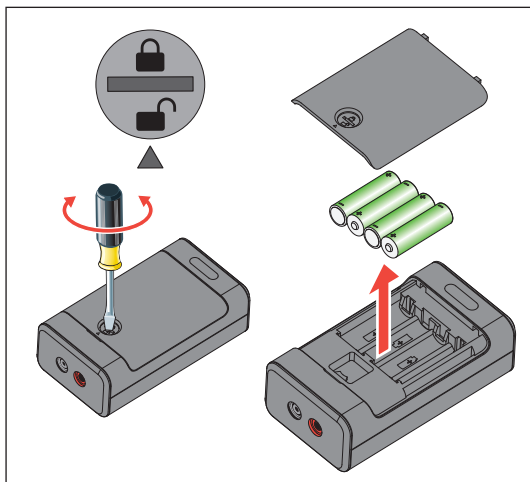


Figure 1. Battery Installation

Maintenance

If the Product fails inspection, tape it shut to prevent unintended operation.

⚠⚠ Warning

To prevent electric shock, fire or personal injury:

- **Before each use, examine the Product. Do not use the Product if it is damaged.**
- **Remove the input signals before you clean the Product.**
- **Use only specified replacement parts.**
- **Have an approved technician repair the Product.**

If the Product does not perform properly, use these steps to help isolate the problem:

1. Verify that battery capacity meets the requirements.
2. Verify that the input and output test lead is good and securely connected.

Clean the Product

Clean with a soft cloth slightly dampened with a mild detergent.

⚠ Caution

To avoid damage to the Product, do not use abrasives or solvents to clean the Product.

If the Probe is not used for long time periods (>60 days) the battery should be removed and stored separately.

General Specifications

Maximum between any Terminal and Earth Ground.....	1000 V ac rms, continuous, 1500 V dc (Single-range)
Input Impedance	10 MΩ / <10 pF
Dimensions	138 mm x 75 mm x 45 mm
Input terminal	4 mm banana jacks
Output terminal.....	BNC (female)
Weight	295 g, batteries included
Accessory Cable	BNC to banana male to male, 1.6 m
Temperature	
Operating	-10 °C to 50 °C
Storage	-30 °C to 60 °C
Operating Humidity	Non-condensing (≤10 °C) ≤90 % RH (at 10 °C to 30 °C) ≤75 % RH (at 30 °C to 40 °C) ≤45 % RH (at 40 °C to 50 °C)
Altitude	
Operating	2000 m
Storage	12 000 m
Ingress Protection	IEC 60529: IP40 (Terminals Mated)
Battery	
Type	4 AA, IEC LR6
Battery Life	168 hours (typical)
Safety	
General	IEC 61010-1: Pollution Degree 2
Measurement.....	IEC 61010-2-030: CAT III 1000 V CAT IV 600 V DC 1500 V
Electromagnetic Compatibility (EMC)	
International	IEC 61326-1: Portable Electromagnetic Environment IEC 61326-2-2 CISPR 11: Group 1, Class A

Group 1: Equipment has intentionally generated and/or use conductively coupled radio-frequency energy which is necessary for the internal functioning of the equipment itself.

Class A: Equipment is suitable for use in all establishments other than domestic and those directly connected to a low voltage power supply network which supplies buildings used for domestic purposes. There may be potential difficulties in ensuring electromagnetic compatibility in other environments, due to conducted and radiated disturbances.

Caution: This equipment is not intended for use in residential environments and may not provide adequate protection to radio reception in such environments.

Emissions that exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object.

Korea (KCC..... Class A Equipment (Industrial
Broadcasting and Communication
Equipment

*Class A: Equipment meets requirements for industrial
electromagnetic wave equipment and the seller or user should take
notice of it. This equipment is intended for use in business
environments and not to be used in homes.*

USA (FCC 47 CFR 15 subpart B. This product is
considered an exempt device per
clause 15.103

Electrical Specifications

Measurement Range..... 1000 V ac rms, 1500 V dc

Accuracy 0.1 % of reading +0.1 % of Range

Bandwidth 100 kHz (Max) See Figure 2.

Scale 4 mV/V

Common Mode Rejection Ratio .. 60 dB at 50 Hz

Temperature Coefficients..... 0.05 % / °C (<18 °C or >28 °C)

Over-range Protection..... 10 % over range

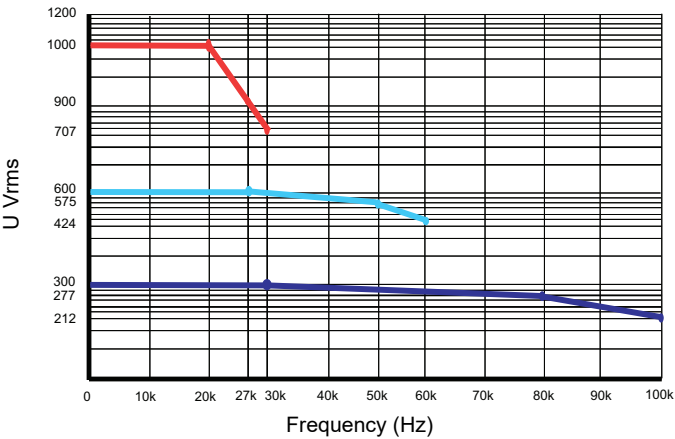


Figure 2. Voltage versus Frequency Derating Curve

LIMITED WARRANTY AND LIMITATION OF LIABILITY

This Fluke product will be free from defects in material and workmanship for one year from the date of purchase. This warranty does not cover fuses, disposable batteries, or damage from accident, neglect, misuse, alteration, contamination, or abnormal conditions of operation or handling. Resellers are not authorized to extend any other warranty on Fluke's behalf. To obtain service during the warranty period, contact your nearest Fluke authorized service center to obtain return authorization information, then send the product to that Service Center with a description of the problem.

THIS WARRANTY IS YOUR ONLY REMEDY. NO OTHER WARRANTIES, SUCH AS FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSED OR IMPLIED. FLUKE IS NOT LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY. Since some states or countries do not allow the exclusion or limitation of an implied warranty or of incidental or consequential damages, this limitation of liability may not apply to you.

Fluke Corporation
P.O. Box 9090
Everett, WA 98206-9090
U.S.A.

Fluke Europe B.V.
P.O. Box 1186
5602 BD Eindhoven
The Netherlands

Beijing Fluke
Rm101, 1/F., Tong Heng Tower
No. 4 Hua Yuan Road Hai Dian
District, Beijing 100088, P.R.C.

11/99